

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A bubble cap adapted for co-current transport of a mixture of a liquid fluid and a gaseous fluid, comprising:

(a) a riser having a top; (b) a cap having a bottom and at least one side slot, the side slot having an upper end, wherein the cap is coupled disposed in relation to the riser to thereby form a space between the riser and the cap; and (c) a divider coupled to at least one of the riser and the cap and disposed in the space, wherein the divider extends and extending to a length of at least 70% [50%] of a distance measured between the top of the riser and the bottom of the cap and wherein the length is selected such that hydraulic resistance is increased to thereby reduce transport of the mixture in the space as a fluid level at the cap increases;

wherein the divider extends across the upper end of the slot such that an upper end of the divider is located above the upper end of the slot and such that a lower end of the divider is located below the upper end of the slot;

wherein the slot is configured to have a length such that the upper end of the slot is above a liquid fluid disposed on a distribution plate;

wherein the bubble cap is coupled to the [a] distribution plate to thereby form a passage for downward flow of a mixture of the [a] liquid fluid and a gaseous fluid through the distribution plate; and

wherein the distribution plate is disposed within a reactor that is configured such that the liquid fluid and the gaseous fluid move in a downward motion within the reactor.
2. (Currently amended) The bubble cap of claim 1 wherein the length of the divider is at least 80% [70%] of the distance between the top of the riser and the bottom of the cap.

3. (Original) The bubble cap of claim 1 wherein the length of the divider is at least 90% of the distance between the top of the riser and the bottom of the cap.
4. (Original) The bubble cap of claim 1 wherein the length of the divider is 100% of the distance between the top of the riser and the bottom of the cap.
5. (Original) The bubble cap of claim 1 wherein the divider is attached to the riser.
6. (Original) The bubble cap of claim 1 wherein the divider is attached to the cap.
7. (Original) The bubble cap of claim 1 wherein the divider is attached to both the riser and the cap.
8. (Original) The bubble cap of claim 1 wherein the bubble cap has at least two dividers.
9. (Original) The bubble cap of claim 1 wherein the bubble cap has at least three dividers.
10. (Original) The bubble cap of claim 1 wherein the bubble cap has at least six dividers.
11. (Original) The bubble cap of claim 1, further comprising a swirl director attached to the riser.
12. (Original) A mixing device having a plurality of bubble caps according to claim 1.
13. (Original) A mixing device having a bubble cap of claim 1 wherein the bubble cap, having at least one slot, is positioned with respect to a distribution plate and the bottom of the cap is positioned at least 1.5 inches from the distribution plate.
14. (Currently amended) A bubble cap, comprising:

a cap with at least one slot that has an upper end, and a riser configured to provide the cap with a skirt height of no less than 1.5 inches, wherein the bubble cap is configured to be coupled to a distribution plate in a vessel such that a liquid fluid and a gaseous fluid flow co-currently upwardly in a space between the riser and the cap;

a divider disposed in a space between the cap and the riser and extending to a length at least 70% [50%] of a distance measured between the top of the riser and the bottom of the cap; [and]

wherein the divider extends across the upper end of the slot such that an upper end of the divider is located above the upper end of the slot and such that a lower end of the divider is located below the upper end of the slot; and

wherein the slot is configured to have a length such that the upper end of the slot is above a liquid fluid surrounding the bubble cap.

~~wherein the divider length is selected such that hydraulic resistance of an upwardly moving mixture of a liquid fluid and a gaseous fluid in the space is increased to thereby (a) reduce flow in the space as a fluid level at the cap increases, and (b) improve distribution of the liquid fluid and gaseous fluid to an area underneath the distribution plate.~~

15. (Original) The bubble cap of claim 14, wherein the skirt height is no less than 2.5 inches.
16. (Original) The bubble cap of claim 14, wherein the skirt height is no less than 4 inches.
17. (Original) The bubble cap of claim 14 wherein the cap has a side that includes at least three slots.
18. (Original) The bubble cap of claim 14, wherein the slot has a length of at least 2.5 inches.
19. (Original) The bubble cap of claim 14, wherein the slot has a length of at least 3.5 inches.
20. (Original) The bubble cap of claim 14, wherein the slot has a length of at least 5 inches.

Claims 21-25 (Canceled)